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DECEMBER 11.

The President, Dr. JOS. LEIDY, in the chair.

Twenty-three persons present.

A paper entitled "Description of a New Species of *Orithoprists* from the Galapagos Islands." By David S. Jordan and Burt Fesler, was presented for publication.

Double Cocooning in a Spider.—Dr. HENRY C. McCook remarked that spiders may be divided into two groups in relation to their cocooning habit. The individuals of one group habitually spin several cocoons. Those of the other group habitually spin but one. The latter, however, are subject to some variation, the reasons for which have not been satisfactorily explained. *Epeira diademata* for example, habitually spins but one cocoon, and yet the Spanish investigator Termeyer,¹ in the early part of this century, discovered and announced that she would spin as many as six cocoons when specially nourished. The fact struck the speaker as an extraordinary one, and he had never yet quite obtained consent to fully admit it.

There are some facts, however, which have recently been uncovered that show a tendency to a variation of habit in this line in one of our familiar orb-weavers. Several years ago a clerical friend, the Rev. Dr. P. L. Jones, had brought him two cocoons of *Argiope cophinaria* (Walck.)² which had been spun on his premises by the same spider. The fact seemed to him strange and interesting, and he reported it. About a year ago, Mrs. Mary Treat brought to Dr. McCook's notice the fact that she had discovered what appeared to be a variety of *Argiope cophinaria*, which makes four cocoons, and which she had accordingly named *Argiope multichoncha*.³ She sent him a string of these cocoons of which there were four of the usual shape and about the usual size, strung within a few inches of each other. They were spun on the wall of a kitchen in a house in western Missouri. Mrs. Treat also sent the spider which spun the cocoons. The specimen was very much dried up and in such a condition that the speaker could not make a very satisfactory study of it, but he found nothing in it differing in the least degree from *Argiope cophinaria*. If it be the same species, what are the peculiar circumstances that have caused such a remarkable variation in the habit? or is it true that this species does, more frequently than has been supposed, indulge herself in the luxury of an additional egg sac? Two cocoons of this lot were opened and found to contain young spiders that had hatched, but died within the egg-sac probably

¹ See Walckenaer's *Apteres* Vol. I, p. 152.

² *Arg. riparia* (Hentz).

³ American Naturalist, December 1887, p. 1122.

because of their unnatural condition. The spiderlings were not counted but they were very numerous.

Through information kindly given by Dr. Leidy, the President of the Academy, Dr. McCook was permitted to study on the 31st October last, (1888,) an example of this duplex cocoonery which occurred in the Farmer's Market of Philadelphia. He visited the market house at 12th and Market Streets, which is one of the largest and best of its sort in our city. He had no difficulty in finding the cocoons which had been preserved, and made a study of them which is here submitted. The facts are as follows: Some time during the summer of the present year, Mr. Charles Moore observed upon his meat stall a spider whose beauty attracted his attention, and which proved to be a female of *Argiope cophinaria*. She had probably been brought into the market from the country, hidden among the leaves of some vegetable, as the huge Tarantula and the large Laterigrade spider, *Heterapoda venatoria*, are brought to our port from the West Indies in bunches of banannas and other fruits. However, she may have floated in as a young balloonist from some city garden, for the species is very abundant in open grounds within city limits. Instead of brushing her down and killing her after the usual manner of dealing with such creatures, Mr. Moore took a fancy to preserve her, and would allow no one around his stall to inflict any injury upon her. Her movements were necessarily somewhat impeded and modified by the business of the place, and several times she changed her web until at last she spun it in a position that was practically free from interruption. This was quite at the top of the stall, the main foundation line, two feet long, was stretched from a standard beam to the end of a projecting iron hook-rod. The spider became quite a favorite and those around the stall amused themselves by feeding her with flies. She would take the flies thrown into her web, coming down from her habitual perch against the central white shield which characterizes her snare, to get them.

Sometime between the 10th and 20th of August she began to make her first cocoon. Mr. Moore, of course, made no careful study of the process; but he said that it was spun early in the morning; that at first the spinning work thrown out was as white as snow; that the spider then began to wrap it up, and it grew smaller and smaller as she wrapped, rolling it around with her feet. After the white material had been spun, a brownish silk was used, and when the spider had completed her task, the ball was not more than half as big as it seemed to him at first. About a week or ten days thereafter, she made a second cocoon, placing it in a position 15 inches above the other. Both of the cocoons were in site precisely as left by the spider. The web, however, had been destroyed, but the speaker noticed that an irregular mass of spinning work was laid along the beam between the two cocoons, which after a little observation proved to be the last snare which the spider had made in a collapsed condition. The foundation line had been broken and the web had thus shrunken up against the post. By delicate and careful manipu-

lation, he was able to draw out this mass, and was delighted to find that he could restore with very little damage the spider's orb, the central shield and zigzag ribbons being quite intact.

The cocoons were both of them spun within tents of crossed lines five or six inches long and four or five wide, and had a thickness of between two and three inches. The lines constituting the under edges of the tents were attached to the post of the stall on which the web was spun. The lower cocoon which was spun first, had the top lines of the surrounding tent stayed against an iron bar used to support meat hooks. The upper tent has its roof lines sustained and drawn out from the post by the foundation line of the orb. The lines of which these tents were spun were of a greenish yellow silk, similar to that which the spider uses in preparing the cocoon. He took the cocoons home and dissected them. The lower one was one and one-fourth inches long, seven-eighths inch wide; was composed of a soft yellow silken plush, and inside was constructed precisely like the ordinary egg-sac of this species. It contained 120 eggs, all of them sterile. The only peculiarity in the cocoon was that the stem which one usually finds at the top was missing. The second cocoon was not quite so large, one inch long, and five-eighths inch wide, but it was more perfect in shape, containing the usual stem. The eggs within this cocoon were also sterile, and the number did not exceed 50. As he had on several occasions counted over a thousand eggs in the cocoon of this species, it will be seen that the spider was not in a normal condition. Indeed he had conceived the idea that in most cases where this spider spins more than one cocoon, it will be found that the eggs are not fertile, and that on the contrary when the eggs are in the normal condition, but one cocoon will be made.

We may probably account for the making of the second cocoon by some abnormal condition of the ovaries which prevented the ovipositing of all the eggs at once. The first lot when extruded were protected in the usual way; subsequently Nature compelled the mother to get rid of the remaining eggs, and, moved by the same impulse that caused her to cover the first lot, she was excited to overspin the second also.

This species will make an imperfect or but part of a cocoon in confinement, and Dr. McCook exhibited a specimen which shows that she sometimes does likewise in natural site. This is a branch which in one place shows the beginning of a cocoon, being the little cup against which the eggs are always spun, and also what appears to be the inner egg-bag. There is nothing more, and the whole is stayed and shut in by the usual tent-like spinning work. Near by is a perfect cocoon secured in quite the same manner. If we suppose that those two were made by the same spider (as is highly probable) we may infer that the original cocooning purpose of the mother was diverted in some manner, perhaps by alarm, which drove her from the spot. She returned to enclose the work partially done; but moved by the urgency of motherhood, presently found a neighboring site and finished her maternal duty.